

Vulnerability Assessment for Public Water Supply Systems

Presented to

City of Bloomington Utilities

December 16, 2002



Agenda

- Why do a Vulnerability Assessment (VA)?
- How to complete your VA
- What's next?



Mandated by EPA

- 100,000+ population served must be completed by March 31, 2003
 - 50,000 to 100,000 by December 31, 2003
 - 3,300 to 50,000 by June 30, 2004
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- Not an unfunded mandate - \$115,000 grant issued for utilities serving 100,000+
 - HNTB identified grant availability and worked with CBU to submit application to EPA



Vulnerability Assessment Methodology

- EPA works with Sandia Labs.
- Sandia recommended Risk Assessment Methodology for Water (RAM-W) which is adopted from other Sandia projects such as RAM-D and RAM-P.
- EPA accepted and approved RAM-W.
- Other methods may be acceptable, but would need to be approved by EPA.



RAM-W Certification

- To complete RAM-W assessment must complete Sandia approved training class.
- HNTB - Indianapolis office has two certified staff:
 - Joe Thais - Project Manager with 20 years drinking water experience
 - John Wujek - I&C and Electrical Engineer with 15 years experience including previous security projects.



RAM-W: Major Components

- Risk Equation: $R = P_A(1-P_E)C$
- Planning
- Likelihood of Occurrence (P_A)
- Facility Characteristics and Threat Assessment (C)
- System Effectiveness (P_E)



RAM-W: Planning

■ Team Selection

- Utility Management
- Emergency Responders
- System Operator
- SCADA Expert
- Subcontract with David Toumey to provide security expertise

■ Develop mission objectives for water system

- Supply high quality water
- Supply adequate pressure
- Meet needs of geographic area
- Supply adequate volume



RAM-W: Planning (continued)

- Complete pairwise comparison to rank mission objectives
- Develop ways to measure impact on each mission objective
 - Financial
 - Duration of outage
 - Impact on quality



RAM-W: Likelihood of Occurrence (P_A)

- $R = P_A(1-P_E)C$
- Likelihood of an undesired event is equal for all facilities
- Therefore, P_A always set to 1



RAM-W: Facility Assessment (C)

- $R = P_A(1-P_E)C$
- Develop list of major facilities and their primary components
- Complete comparison to rank major facilities against mission objectives
- Develop and assess potential threats and events that may keep the system from meeting its mission objectives
- Assign value for C (high, medium or low) to major facilities or components



RAM-W: System Effectiveness (P_E)

- $R = P_A(1-P_E)C$
- Evaluate existing protection systems at the major facilities compared to the potential threats
- Assign value for P_E (high, medium or low) for that level of each facility or component



RAM-W: Determine Relative Risk

- Utilize risk equations to calculate risk level for each major facility

$$R = P_A(1-P_E)C$$

- Rank the relative risk to determine the most vulnerable facilities
- Propose potential upgrades to reduce risk at the most vulnerable facilities
- Recalculate relative risk with upgrades
- Prepare report for approval by the CBU and submission to EPA



What's Next?

- Begin implementation of recommended upgrades
- Complete and submit Emergency Response / Operating Plan within 6 months after VA



Questions?

